CITY OF GAHANNA

ADDENDUM #1

2015 STREET PROGRAM, ST-1029

1. Item 413 Crack seal has been revised to 423. Please refer to the attached Bid Tabulation, and Supplemental Specification.
2. Additional detail has been added to the Supplemental Specifications regarding Item 18 Storm Sewer Improvements. Please refer to the attached Supplemental Specifications for additional details.
3. Additional detail has been added to the Supplemental Specifications regarding Alternate #4, Heil Drive Waterline Replacement. Please refer to the attached Supplemental Specifications for additional details.
4. The Bid Tabulation has been revised to remove any reference to Avonwick.
5. The full depth pavement replacement Supplemental Specification has been revised. Please refer to the attached Supplemental Specifications for additional details.
6. Various updates/revisions to the Supplemental Specifications (Concrete Base, Maintaining Traffic, and Construction Layout Stakes). Please review the attached Supplemental Specifications for details.

Please attach with sealed proposal due on **April 3, 2015 @ 11:00 AM**

ADDENDUM #1 is hereby acknowledged:

_____
Signature and Title

_____
Company Name

_____
Date

Issued: 3/31/2015

2015 STREET PROGRAM, ST-1029
SUPPLEMENTAL SPECIFICATIONS

PROPOSAL - No extra compensation will be paid to the contractor by reason of compliance with any of the requirements indicated in the specifications, but payment shall be deemed to be included among the several items, as bid upon, unless otherwise specifically provided.

COMPLETION DATE – The work under this contract shall be completed in a manner acceptable to the City on or before the date listed in the notice to bidders unless an extension of time is granted in writing by the Director of Public Service.

REFERENCE SPECIFICATIONS – The requirements of the City of Gahanna, together with the "Construction and Material Specifications, City of Columbus, Ohio" including all supplements thereto in force on the date of the contract, shall govern all materials and workmanship involved in the improvements, except as such specifications are modified herein.

MAINTAINING TRAFFIC – One lane, two-way traffic shall be maintained at all times, except for Flint Ridge Drive, Heil Drive, and Brookhaven Drive. All traffic control devices, including lights, signs, and barricades shall be constructed erected and maintained in accordance with the "Ohio Manual of Traffic Control for Construction and Maintenance".

The cost of all lights, signs, barricades, police patrolmen, and watchmen necessary to maintain the aforementioned condition shall be included in the price bid for the various items as set forth in the proposal.

ITEM 203 EXCAVATION (Flint Ridge Drive, Heil Drive, and Brookhaven Drive) – This item shall include the removal of existing pavement, expansion joints, additional subgrade and curbs as identified by the Engineer, and any other miscellaneous excavation necessary for the reconstruction of the roadway. Disposal of excavated materials shall be the responsibility of the Contractor.

Also included under this item shall be subgrade fine grading and compaction, and any saw cutting necessary between remaining sections and the sections to be removed. Payment for this item will be made at the contract lump sum price.

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SUPPLEMENTAL SPECIFICATIONS (CONT.)

ITEM 253 FULL DEPTH PAVEMENT REPAIR – In accordance with the City of Columbus Construction and Material Specifications. This work consists of removing existing asphalt concrete, brick, PCC, or aggregate pavement courses, shaping, and compacting the exposed base material.

All repairs shall be left in a condition that is suitable to support traffic at the end of each work day, and during times of non-work periods. All repair areas shall be completed within 3 calendar days from when the work begins. "Bump" signs shall be supplied for all areas of where there is an uneven surface.

Also included under this items shall be the correction of any subgrade material as directed by the engineer.

Payment is full compensation for furnishing of all materials, labor and equipment, including aerosol spray paint and replacement and restoration materials; cutting, removing, and disposing of existing pavement; shaping and compacting the underlying material, subgrade correction, placing new pavement; and restoring the shoulders for all labor, equipment, and incidentals necessary to complete this work.

Replacement pavement sections for roadway shall adhere to the following:

Base repair as needed, 7" 301 asphalt concrete base (placed in two lifts), and 2.0" asphalt concrete surface course.

Payment for this item will be made at the contract unit price per square yard.

ITEM 254 PLANING – In accordance with the City of Columbus Construction and Material Specifications. Prior to asphalt concrete placement, all loose material shall be removed and disposed of by the Contractor. The edges of the remaining asphalt concrete shall be painted with RS-1 or an approved equal tack coat.

The procedure for ***1" to 3" Planing*** will be to plane the existing asphalt surface down to the existing concrete surface with the exception of streets with Water-Bound Macadam base where a minimum of ½" of asphalt is to remain. Payment for this item will be made at the contract unit price per square yard.

Butt joints are to be 6' wide at a depth beginning at 2" and tapering to zero to allow for 2" of asphalt to be feathered into an existing asphalt surface. This items shall be included with the unit price bid for ITEM 254 Planing. No separate payment will be made for Butt Joints.

All planed surfaces shall be overlaid within 7 calendar days of planing completion. After the existed surface is planed, "BUMP" signs shall be provided until the surface is overlaid to provide notification of an uneven surface.

ITEM 306 7" CONCRETE BASE

Item 306 – 7" Concrete Base shall reference Item 452 – Non-Reinforced Portland Cement Concrete Pavement. The concrete proportioning shall meet the requirements of Item 499, Concrete, Class C.

Item 306 – 7" Concrete Base shall reference Item 452 – Non-Reinforced Portland Cement Concrete Pavement. Except that longitudinal joints are not required.

ITEM 410 TRAFFIC COMPACTED SURFACE – This item has been included for use in aiding ingress/egress during the construction activities, Traffic Maintenance and to achieve proper subgrade densities, as approved by the engineer. Payment for this item will be made at the contract unit price per cubic yard.

ITEM 423 CRACK SEAL – In accordance with the Ohio Department of Transportation Construction and Material Specifications equivalent to the previous City of Columbus Item 413, Type I. Payment will be made at the contract unit price per square yard.

ITEM 448 ASPHALT CONCRETE – During the installation of the 448 intermediate and surface asphalt courses, the Contractor must be able to obtain compaction test results that are a minimum of 96% of the Maximum Theoretical Density. Prior to the start of production, the asphalt supplier shall submit the JMF (Job Mix Formula) proposed for each mix, including the Maximum Theoretical Density values.

During construction the City will utilize nuclear gages to continually test the density of the asphalt as it is being installed to insure that the compaction of the asphalt falls within these ranges. The Contractor shall be responsible for insuring that proper rolling equipment is utilized to produce the densities specified. In the event the equipment is not capable of producing the densities specified, the placed material shall be removed and replaced at the Contractor's expense. These requirements are in addition to the other requirements contained within the Columbus Construction Materials Specifications.

Payment for 448 intermediate and surface courses shall be made at the contract unit bid price per cubic yard according to thickness as specified in the proposal.

Patching is intended to allow for 1-1/2" of asphalt to be placed on top of the milled surface to ensure the transition from the curb ramp to the pavement is compliant, as defined by the Engineer. Payment for this item will be made at the contract unit price per square yard.

SUPPLEMENTAL SPECIFICATIONS (CONT.)

ITEM 608 PCC CONCRETE WALK – This work shall include the construction of new sidewalks to the lines, grades and cross sections to meet the requirements for the construction of ADA compliant curb ramps identified in the proposal, where shown on the plans or deteriorated sidewalks marked for replacement by the Engineer. Concrete walks shall be 4" in thickness, and increased to 6" in thickness for residential driveway aprons, and 8" for commercial driveway aprons.

Also included under this item shall be the adjustment of any valves encountered in constructing the sidewalk and furnishing and installing expansion material around existing appurtenances and existing sidewalks as required by the Engineer. Payment for this item will be made at the contract unit price per square foot.

ITEM 609 CURB RAMPS – Curb ramps shall be constructed to the lines, grades, and cross sections required to meet ADA compliance. Curb ramps shall conform to the City of Columbus Standard Drawings *2319 DR. A,* except as modified herein. All ramps shall have Type E detectable warnings (Armor Tile panels or approved equal) in accordance with City of Columbus Supplemental Specification 1551.01, 1551.02, 1551.03, and 1551.04**.** The cost of the detectable warnings shall be included in bid price of the ramp. Completed curb ramps not meeting ADA dimensions and slope requirements shall be reconstructed at the Contractor's expense.

Also included under this item shall be the removal and replacement of any stop signs or street name signs necessary due to the reconfiguration of the curb ramps.

This item shall include all excavation, removal of existing sidewalk and curb ramps as directed by the project plans or engineer, backfill, topsoil, seeding, and disposal of surplus excavation.

Payment for this item shall be made at the unit bid price per ramp. This includes the ramp, detectable warnings, flared sides and rolled edges.

SUPPLEMENTAL SPECIFICATIONS (CONT.)

ITEM 609 CURB REPLACEMENT – This work shall include the removal and the replacement of combination curb and gutter necessary for the construction of compliant curb ramps or replacement of deteriorated combination curb and gutter sections as identified and marked by the Engineer.

Replaced combination curb and gutter shall be installed to the original lines, grades and cross sections, or when near curb ramps, to the lines grades and cross sections to meet ADA requirements for compliant curb ramps.

This item shall include all excavation, backfill, topsoil, seeding, and disposal of surplus excavation and removed curb and gutter, furnishing and installing joint materials and any asphalt patching.

The joint separating the gutter from the street is required to be sawcut in areas where the concrete extends into the area to be paved. The cost of this work is to be included in this item. Also included in this item is any saw cuts necessary to provide a neat joint at the removal limits as marked by the Engineer. Roof drain openings shall be provided through the curbs for all existing drain lines. The cost for these providing openings and extending all existing drain lines through these openings shall be included in this item. Payment for this item will be made at the contract unit price per lineal foot of curb replaced.

ITEM 614 MAINTAINING TRAFFIC – All traffic control devices, including lights, signs, and barricades shall be constructed erected and maintained in accordance with the "Ohio Manual of Traffic Control for Construction and Maintenance".

The cost of all lights, signs, barricades, police patrolmen, and watchmen necessary to maintain the aforementioned condition shall be included in the price bid for this item.

Flint Ridge Drive, Heil Drive, and Brookhaven Drive can be closed to traffic as required for removal and reconstruction of the road. To help minimize the disruption to the community, Heil Drive and Flint Ridge shall be replaced in three phases. Heil Drive and Flint Ridge Drive shall be replaced one-half at a time, and constructed up to the intermediate asphalt course for both halves, with the final phase being the placement of the asphalt surface course for the entire roadway. Once the road is closed, the construction of the new road shall be continuous so that the roadway can be opened as soon as possible to residents. Closure time shall be kept to a minimum and no longer than 16 calendar days per phase. Any exception shall be subject to approval in advance by the City Engineer. Property owners affected by the road closure are to be given 72 hours written notice before closing the road.

SUPPLEMENTAL SPECIFICATIONS (CONT.)

The contractor shall notify the local Fire Department and the Gahanna Police Department prior to said closings and shall make provisions for access to the roadway should an emergency require access by either the fire or police department. A quantity of ***Item 410 Traffic Compacted Surface*** has been included for use in providing and maintaining traffic. The use of this item shall be subject to approval by the City Engineer.

After placement of the concrete/roller compacted concrete base, the road shall be opened within 24 hours. In addition, once the concrete/roller compacted concrete base has been placed the intermediate course for Flint Ridge and Heil Drive shall be completed within 7 calendar days. Once the concrete/roller compacted concrete base has been placed the intermediate and surface courses for Brookhaven Drive shall be completed within 7 calendar days.

ITEM 623 CONSTRUCTION LAYOUT STAKES – The Contractor shall provide all staking required to reconstruct Flint Ridge Drive, Heil Drive, and Brookhaven Drive on present alignment and profile in accordance with the supplied sections within the Appendix. All staking shall be completed under the field supervision of a Registered Professional Surveyor. A base line shall be established at 25-foot stations along each side of the existing curbs to establish horizontal alignment. Elevations of existing profile grade shall be obtained at the 25-foot stations, curb inlets, and all grade breaks so that the road can be replaced on present alignment and profile. The existing and proposed grades shall be submitted to the Engineer for approval two weeks prior to roadway work commencing. Payment for this work shall be made at the contract lump sum price.

ITEM 653 & 659 TOPSOIL, SEEDING AND MULCHING – The Contractor shall provide suitable topsoil material in accordance with Item 653 at a nominal depth of 4” to properly fill all voids and level uneven ground left by construction of ADA Ramps and other construction activities. These areas shall be seeded and mulched in accordance with Item 659. All areas disturbed or graded shall be graded to a slope of 4:1 or flatter. Payment for this item will be made at the contract lump sum price for each project.

AGGREGATE BERMS – This work shall include all necessary labor, materials, and equipment necessary the excavation for and installation of a 2’ wide berm of Item 304 stone 6” deep where indicated, or as directed by the engineer. Payment for this item shall be made at the contract unit price per lineal foot.

SUPPLEMENTAL SPECIFICATIONS (CONT.)

REMOVE/REPLACE BASE OF CONCRETE DRIVES – This item includes the removal, all saw cuts required to remove, disposal, and the replacement of the lower portion of each driveway approach or concrete pad adjacent to the existing curb within the roadway reconstruction limits. Limits of removal shall extend from the back of curb to the sidewalk. The concrete drive shall be 6" in thickness for residential driveways and 8" for commercial driveways. All surfaces shall be sealed with a surface applied sealant to protect the new concrete from salt, etc. Payment for this item will be made at the contract unit price per square yard of concrete drive replaced.

RESTORATION AND CLEANUP – It is the intent of the City to keep inconvenience to the property owners to an absolute minimum. All work prescribed and described in these specifications is situated in improved areas. Any street signs or landscaping features removed during construction by the Contractor must be restored by the Contractor in a timely manner. The cost for removing and replacing signs, mailboxes and landscaping features shall be included in the price bid for the various items as set forth in the proposal. All work is to continue on a uniform basis and on schedule, particularly the restoration and cleanup of disturbed areas after construction. Disturbed areas such as sidewalks and curb ramps must be clearly marked by the contractor until the work can be completed. The City will pay only for those items that are completed in their entirety as described in the specifications.

SUPPLEMENTAL SPECIFICATIONS (CONT.)

Mill Street and Granville Street Crosswalk Repairs - All work and materials shall conform to City of Columbus and City of Gahanna specifications. Where specifications conflict, the more stringent requirement shall govern. Due to planned City events in the area, this work shall not commence any sooner than June 22, 2015.

1. Remove existing crosswalk and pavement to full depth. The crosswalk shall be extended to the north so that is extends completely across the intersection to the curb on the north side. The contractor shall salvage, and stockpile existing crosswalk bricks. Bid price shall include all costs for labor, materials, equipment, milling, excavation, necessary saw cutting, storage and disposal.
2. The existing roadway shall be milled to a depth of 1.5" to a distance of 10' from the existing crosswalk on both sides.
3. Prior to crosswalk construction, ensure all utility structure castings are properly secured and level.
4. Construct crosswalk utilizing high early strength concrete. The base shall be a 10" thick slab with WWF. The curb may or may not be poured integral with the slab. Refer to special note for details regarding this item. Please refer to City of Columbus (COC) SS 1524 regarding roadway paver construction.
5. Upgrade the existing crosswalk on the south side of Granville Street to current ADA and City Standards.
6. Perform paving of milled areas utilizing 1.5" of Type 1H, PG70-22 asphalt concrete surface course.
7. Provide all necessary pavement striping.
8. Lane closures may only occur during the hours of 9a.m. to 3p.m., and 9p.m. to 5a.m. Monday – Friday. Lane restrictions are permitted on Saturdays and Sundays. No work of lane restrictions may occur during holidays or planned city events in this area. Traffic must be maintained at all times. All traffic control measures are the responsibility of the contractor and must adhere to the latest edition of the Ohio Manual of Uniform Traffic Control Devices (OMUTCD).
9. The contractor's price shall be a lump sum. Bid price shall include maintenance of traffic necessary to construct the improvements. Contractor shall supply anticipated work hours for Saturday and Sunday, as well as an anticipated schedule with their bid.

SUPPLEMENTAL SPECIFICATIONS (CONT.)

Mill Street Crosswalk Improvements - All work and materials shall conform to City of Columbus and City of Gahanna specifications. Where specifications conflict, the more stringent requirement shall govern. Due to planned City events in the area, this work shall not commence any sooner than June 22, 2015.

1. The contractor's price shall be a lump sum bid for all work described and shown on the attached plan. Bid price shall include maintenance of traffic, labor, materials, equipment, etc., necessary to construct the improvements. Contractor shall supply anticipated work hours for Saturday and Sunday, as well as an anticipated schedule with their bid.
2. Pedestrian traffic must be maintained on the sidewalk along the east side of Mill Street during construction.
3. Lane closures may only occur during the hours of 9a.m. to 3p.m., and 9p.m. to 5a.m. Monday – Friday. Lane restrictions are permitted on Saturdays and Sundays. No work of lane restrictions may occur during holidays or planned city events in this area. Traffic must be maintained at all times. All traffic control measures are the responsibility of the contractor and must adhere to the latest edition of the Ohio Manual of Uniform Traffic Control Devices (OMUTCD).

Heil Drive Waterline Improvements - All work and materials shall conform to City of Columbus and City of Gahanna specifications. Where specifications conflict, the more stringent requirement shall govern. These improvements are only expected in the event that the Alternate #2 is accepted by the City. This item would assume that the roadway would be removed as part of Alternate #2 prior to waterline construction.

Storm Sewer Improvements - All work and materials shall conform to City of Columbus and City of Gahanna specifications. Where specifications conflict, the more stringent requirement shall govern. This item is intended for the installation of approximately 10' of 12" storm sewer for the curb ramp and sidewalk installation at the intersection of Cherry Bottom Road and Coldwell Drive.

CITY OF COLUMBUS
PUBLIC SERVICE DEPARTMENT
TRANSPORTATION DIVISION

SUPPLEMENTAL SPECIFICATION 1551 *(Modified for City of Gahanna*)
DETECTABLE WARNINGS

March 1, 2004

1551.01 Description.

This work shall consist of furnishing all material, equipment, and labor necessary for the placement of detectable warning devices at curb ramps or other walking surfaces, complete and ready for service at locations shown on the plans. All work shall be in accordance with City of Columbus Standard Drawing 2319 Dr. A and with Section 1108 of the Architectural and Transportation Barriers Compliance Board's "Draft Guidelines For Accessible Public Rights-of-Way", dated June 17, 2002 as amended, supplemented and adopted.

1551.02 Materials.

All products shall receive prior approval by the City Engineer and be included in the City of Columbus, Transportation Division current listing of approved Producers and Products for detectable warning surfaces. New Products shall be submitted for review and approval in accordance with the City's General Policy and Procedures for New Products, Materials, and Construction Procedures.

Detectable warning surfaces shall be textured to provide slip resistance and shall contrast visually with adjacent walking surfaces – either light-on-dark, or dark-on-light. The preferred color for a light background shall be brick red. The preferred color for a dark background shall be safety yellow or light granite. Other colors may be specified or approved by the City Engineer provided that samples are submitted to and approved by the City Engineer at least three (3) working days prior to installation. Color submittals shall include manufacturer's statement of percentage of visual contrast provided according to ADAAG A4.29.2. Color shall be integral with the detectable warning device and shall not be surface applied. Paints or other surface coatings shall not be used.

Detectable warning surfaces shall be classified by type of material and/or application method:

Type "A" – Pre-Cast, Manufactured Clay and Concrete Pavers - ***Approved for new construction, only.***

Type "B" – Surface-Applied or Surface-Formed Domes – Generally includes truncated domes bonded to the surface of existing curb ramps - ***Approved for retrofit, only***.

Type "C" – Stamped, Color Dyed Concrete - ***Approved for new construction, only***.

Type "D" – Surface-Mounted, Thin Tile and Thin Molded Sheet Goods – Generally includes tiles or mats (rigid & flexible, with preformed truncated domes), bonded and/or anchored to the surface of existing curb ramps - ***Approved for retrofit, only.***

Type "E" – Pre-Manufactured, Wet-Set Products **–** Generally includes rigid products pressed into freshly formed concrete - ***Approved for new construction, only.***

1551.03 Dimensions.

Truncated domes in a detectable warning surface shall have a base diameter of 0.9 inches (23 mm) minimum to 1.4 inches (36 mm) maximum, a top diameter of 50% of the base diameter minimum to 65% of the base diameter maximum, and a height of 0.2 inches (5 mm).

Truncated domes in a detectable warning surface shall have a center-to-center spacing of 1.6 inches (41 mm) minimum and 2.4 inches (61 mm) maximum, and a base-to-base spacing of 0.65 inches (16 mm) minimum, measured between the most adjacent domes on a square grid.

Detectable warning surfaces shall extend 24 inches (610 mm) minimum in the direction of travel and the full width of the curb ramp, landing, or blended transition.

Pavers shall be laid so that the centers of domes align with a straightedge placed both perpendicular and parallel with the

direction of travel. Dome Alignment may not differ by more than 1/4-inch.

The detectable warning surface shall be located so that the edge nearest the curb line is 6 inches (150 mm) minimum and 8 inches (205 mm) maximum from the face of the curb line.

Domes shall be aligned on a square grid, aligned in rows parallel and perpendicular to the predominant direction of travel. Domes must be not be skewed diagonally to the direction of travel.

1551.04 Application.

Detectable warning devices shall be installed in accordance with manufacturer's specifications, except as modified by this specification or as otherwise specified on the plans. The finished surface shall be uniformly profiled to match the adjoining surfaces without lips, obstructions and shall drain completely.

The contractor shall warrant the installed surface to last no less than five years without losing more than two percent of the truncated domes due to delaminating as a result of product failure, and shall further warrant the surface for a minimum of five years against fading, chipping, peeling, cracking, or loss of original shade due to sunlight, salt or exposure to weathering.

Special Application Notes: Type "A" – Pre-Cast, Manufactured Clay and Concrete Pavers:

- Pavers shall be laid on an unreinforced concrete base. Thickness of the base shall be the greater of 4-inches or the specified, nominal thickness of the curb ramp.

- Pavers shall be set into a 1/2-inch thick bed of freshly poured latex or epoxy -modified cement mortar.

- Pavers (exclusive of domes) shall be flush with the surrounding concrete. The surface shall not differ by more than 1/8-inch in height.

- Pavers shall be laid so that the centers of domes align with a straightedge placed both perpendicular and parallel with the direction of travel. Dome Alignment may not differ by more than 1/4-inch.

- Joints between pavers and surrounding concrete surface shall be mortared and shall not exceed 1/4-inch in width. Mortared joints shall be flush with top surface and struck so as to give a smooth surface.

- Joint spacing between pavers shall be no greater than 5/32-inch and not less than 1/16-inch. Pavers shall not be directly touching each other unless they have spacing bars

- Joints between pavers shall be sand-filled. Sand shall be washed, non-plastic, well-graded angular material free from deleterious or foreign matter, with maximum particle size not larger than the specified joint spacing. Gradation shall conform to Item 703.02 fine aggregate for concrete. Sweep this material to fill the joints and water with a fine mist. Repeat as necessary to achieve a sand-filled joint. When requested by the Engineer, the Contractor shall submit gradation analysis of the proposed joint material performed in accordance with ASTM C-136.

- Pavers shall consist of full, completely formed domes and shall be crack-free.

- The face of all pavers shall be clean of cement and protected so as to avoid chipping during construction.

- A minimum of 6-inch horizontal edge restraint shall be provided around the full perimeter of the detectable warning pavers. The restraints shall consist of Class "C" cast in place concrete, (City of Columbus CMS item 499).

CITY OF COLUMBUS
PUBLIC SERVICE DEPARTMENT
TRANSPORTATION DIVISION
SUPPLEMENTAL SPECIFICATION 1523
ROLLER COMPACTED CONCRETE PAVEMENTS (RCC)
APRIL 15, 2006

ROLLER COMPACTED CONCRETE PAVEMENTS (RCC)

1523.01 Description

This Supplement outlines the requirements for production and construction of Roller Compacted Concrete (R.C.C.) pavement for City streets. In addition to this supplement, items 305, 306, 401, 407, 451, and 700 of the City of Columbus Construction and Material Specifications (CMSC) apply where applicable.

1523.02 Materials Requirements

All materials to be used shall be from approved sources as documented on the “Approved Materials List” on file in the City’s testing laboratory.

Cement: Portland Cement shall conform to the standard specification for Portland Cement Type I, ASTM C 150 (latest edition).

Fly Ash: Fly Ash shall conform to ASTM C 618 Class F and section 705.13 of the CMSC.

Aggregates: Fine and course aggregates shall meet the requirements of section 703.02 of the CMSC for Portland Cement Concrete, item 305 and 306. The aggregates shall be well graded to conform to the following composite gradation.

Sieve Size	Percent Passing
1”	100
3/4”	90 – 100
1/2”	70 – 90
3/8”	60 - 85
#4	40 – 70
#16	20 – 40

#100	5 – 20
#200	2 - 8

Water: Clean, potable and free from oil, acid, and strong alkalies or organic materials.

Admixtures (other than fly ash): Meet applicable ASTM standards.

1523.03 Mix Design

The Contractor/Supplier shall develop an R.C.C. mixture proportioned in accordance with this specification and procedures discussed in ACI 325.10R-95 “State-of-the-Art Report on Roller-Compacted Concrete Pavements” sections 4.2 and 4.3. Once the mix has been designed, certified test data shall be submitted in accordance with Section 101.10 of the CMSC from a recognized testing laboratory that shows the proposed mix design will meet the following requirements.

Compressive Strength, Cylinders: 3500 psi @ 28 days
Flexural Strength, Beams: 500 psi @ 14 days
Splitting Tensile Strength, Cores: 400 psi @ 14 days

The minimum Cementitious Material shall be 350 pounds per C.Y.

Fly Ash may only be used between April 1 and November 1 unless otherwise authorized by the Project Engineer.

1523.04 Equipment

Mixing Plants: Mixing plants shall be of a design that can produce an R.C.C. pavement mixture of the proportions defined in the approved mix design and within the specified tolerances in ASTM C 94 and ASTM C 685. The mixing plant may be a Central-Mix Drum or a Stationary Continuous-Mixing Twin-Shaft Pugmill mixer. The plant shall have a minimum manufacturer’s rated capacity of 200 tons per hour.

Paver: RCC shall be placed with a high-density or conventional asphalt type paver subject to approval by the Engineer. The paver shall be capable of placing RCC to a minimum of 85% of the maximum wet density in accordance with ASTM D 1557 or equivalent test method. The paver shall be of suitable weight and stability to spread and finish the RCC material, without segregation, to the required thickness, smoothness, surface texture, cross-section and grade.

Alternative Paving Equipment. In areas not accessible to paving machines, alternative paving equipment including graders and dozers may be used, if approved by the Engineer. The equipment shall be capable of producing a finished product that results in a smooth, continuous surface without segregation, excessive tearing, or rock pockets. Work in areas inaccessible to paving machines will be performed according to 1523.07 of these specifications.

Pneumatic Rollers: Pneumatic rollers shall be self-propelled, with overlapping tire positions capable of providing full compaction in a single pass. Static weight shall be no less than 10 tons, or more than 20 tons. Tire configuration shall be 5 front and 6 rear.

Vibratory Rollers: Vibratory rollers shall be self-propelled, double drum, steel wheel vibratory rollers having a static weight of at least 10 tons. Each roller drum shall be equipped with a properly operating scraper and brush. The rollers shall transmit a dynamic impact to the surface through smooth steel drums by means of revolving weights, eccentric shafts or other equivalent methods. The roller drum shall be between 4 and 5-1/2 foot in diameter and 5-1/2 to 8 feet in width.

Finish Rollers: Finish rollers shall be self-propelled, double drum, steel wheel rollers having a static weight of between 3 and 10 tons. Each drum shall be equipped with a properly operating scraper and brush. A single drum vibrator roller with a vulcanized rubber coating may be utilized for finish rolling, at the approval of the engineer.

Equipment for Vertical Cuts in R.C.C. Pavement: To cut vertical joints in fresh R.C.C. pavement, equipment such as a wheel cutter or other approved equipment capable of cutting vertically, the full depth of the layer, shall be used. If the Contractor waits until the R.C.C. hardens to make vertical cuts, concrete sawing equipment shall be used to make the vertical cuts.

1523.05 Placing RCC

Cold Weather Limitations: R.C.C. shall not be placed on any surface containing frost or frozen material. R.C.C. shall only be placed when the ambient temperature is a minimum of 35°F and rising, unless the procedures set forth in section 451.061 “Depositing and Curing Concrete During Cold Weather”, of the Construction and Material Specifications, are strictly adhered to. Conformance will be closely monitored and stringently enforced.

Hot Weather Precautions: During periods of hot weather or windy conditions, special precautions shall be taken to minimize moisture loss due to evaporation. Precautions may include cooling of aggregate stockpiles by the use of a water spray, protective covers on dump trucks, temporary windbreaks to reduce wind velocity, cooling of concrete mix water, decreasing the allowable time between mixing and final compaction, and keeping the surface of the newly placed R.C.C. pavement damp with a light spray during compaction and finishing operations.

Rain Limitations: No placement of R.C.C. pavement shall be done while it is raining hard enough to be detrimental to the finished product. Placement may continue during light rain or mist provided the surface of the R.C.C. pavement is not eroded or washed. Dump truck covers must be used during these periods. The Engineer will be the sole judge as to when placement must be stopped due to rain.

Subgrade Preparation: Prepare the subgrade according to Section 204 of the CMSC. If required, construct a granular base according to Section 304.

Moisten the surface of the subgrade or base without creating mud or ponding water, to minimize absorption of water from R.C.C. mix to be deposited.

Transporting: Transport the R.C.C. mixture to the site in dump trucks with boxes cleaned out before loading and provided with protective covers properly secured in place until discharge. The trucks shall dump directly into the hopper of the paver unless placement is by hand as directed by the Engineer. Hauling over the freshly placed R.C.C. will not be permitted.

Continuity: Co-ordinate R.C.C. delivery so the mix can be spread and rolled within the specified time limit and to ensure uniform progress of the paver until the paving operation is complete. The time between mixing, and compacting shall not exceed ninety (90)minutes, for all RCC placed, provided that the temperature of the RCC does not exceed 90 degrees (F). This time limit may be increased or decreased by the Engineer dependent upon ambient conditions of temperature and humidity.

Spreading: Spread the material to a sufficient depth that will produce the specified thickness when compacted and conform to the required cross-sections and grade. Operate the paver in a manner that will prevent segregation and will produce a smooth continuous surface without tearing, pulling or shoving. Placing of the R.C.C. mix shall be done in a pattern so that the water from previously placed R.C.C. will not affect the fresh surface or subgrade. Where required, broadcasting or fanning of R.C.C. must be performed immediately behind the paver. Any R.C.C. surface that has been compacted “rolled” but is not cured, must be scarified at least one inch

deep prior to broadcasting fresh R.C.C. over the top. Broadcasting must be completed in the allotted time within these specifications.

Segregation: If segregation occurs, suspend the paving operation until the cause is determined and corrected. Rake off segregated coarse aggregate before rolling. Broadcasting or fanning of R.C.C. mixture onto areas being compacted is not permitted.

Placing Adjacent Lanes: All R.C.C. on both sides of the longitudinal joint formed by placing an adjacent lane, must be compacted within 90 minutes of plant mixing, unless a cold joint is provided.

1523.06 Compaction and Finishing

Required Density: The Contractor is responsible for achieving 98% of the maximum wet density, as determined in the laboratory according to ASTM D 1557.

Start of Rolling: Begin compaction operations within fifteen (15) minutes after spreading of the R.C.C. mix. Any additional delay will result in the coring of the affected area at the Contractors expense to ensure that it meets the requirements of this specification.

Rolling Pattern: Establish a rolling pattern that will achieve the required density with a minimum number of roller passes.

Vibratory Rolling: During vibratory compaction, the roller shall not be started, stopped, or left standing in vibratory mode. Stagger the stopping point of successive rolling passes to avoid forming depressions on the surface.

Surface Check: Continually check the R.C.C. surface while still plastic to ensure surface and grade tolerances are met. Immediately correct excessive variations in accordance with the spreading requirements.

Finish Rolling: Remove any roller marks on the surface using a steel drum roller in static mode.

Lane Edge: Each edge of each lane shall be constructed with a vertical or a 15-degree from vertical configuration.

1523.07 Small Areas

Spread RCC mix by hand in areas not accessible by the paver, as directed by the Engineer.

Compact the mix to the required density using suitable walk-behind vibratory compaction equipment. The vibratory equipment must have a minimum centrifugal force of 2,200 pounds and/or 70 pounds per square inch. Compaction of these areas must be performed immediately after placement of the R.C.C. in order to avoid moisture loss.

1523.08 Joints

Fresh Joint: A fresh joint is made when R.C.C. on both sides of the joint are compacted within 90 minutes of plant mixing. Ensure that the contact face is moist and not segregated. Before rolling, hand-finish the joint as necessary to produce a tight surface. Roll extra passes as necessary to achieve the required density and smoothness in the joint area.

Cold Joint: A cold joint is made when either side of the joint is not compacted within 90 minutes of plant mixing. Sawcut the edge of previous lane back to sound R.C.C. to form a vertical face. Trimming by grader blade may be permitted if done at the end of the workday or the first thing the following day. Place fresh grout on the vertical face just before placing fresh R.C.C. against it. Before rolling, hand-finish the joint as necessary to produce a tight surface. Roll extra passes as necessary to achieve the required density and smoothness in the joint area. Every effort shall be made to maintain longitudinal joints as a fresh joint as described in “Fresh Joint” above.

Transverse Joint: May be a Fresh Joint or Cold Joint as described above. They shall be spaced at a maximum of 30 foot intervals, or at intervals directed by the Engineer and cut to a depth 1/3 of the specified pavement thickness.

Longitudinal Joint: Leave the outer 12 to 18 in. of the paving lane uncompacted during the initial rolling operation. This uncompacted edge is then used to set the height of the paver screed for paving the adjacent lane. After the adjacent lane is placed, the joint is compacted by centering the roller drum over the joint and compacting the adjacent lane edges simultaneously.

1523.09 Curing

R.C.C. without Asphalt Surfacing applied within 72 hours: Keep the R.C.C. surface continuously moist by water, fog spray, wet burlap, or an approved membrane-forming curing compound, or polyethylene sheeting for a period of 7 days. Apply curing compound at 1-1/2 times the rate specified by the manufacturer.

R.C.C. with Asphalt Surfacing applied within 72 hours: Immediately after final rolling, apply an asphalt emulsion per item 407 of the CMS. Apply at 1-1/2 times the rate specified by the manufacturer.

1523.10 Tolerances

R.C.C. pavement construction shall be subject to Section 451 of the CMSC.

1523.11 Quality Assurance and Control

Responsibility: Testing at the plant and the paving site is the responsibility of the Contractor or Developer and shall be performed by a private Independent Testing Laboratory approved by the City. The Contractor and Supplier shall provide safe and convenient access, acceptable to the Engineer, for the inspection and sampling of the R.C.C. and constituent materials, at both the production plant and the paving site, and shall cooperate in the inspection and sampling process at all times.

Test Strip: The contractor shall construct a test section of a thickness equal to the design thickness with at least 100 tons of R.C.C. The test strip will be used to resolve anticipated problems with equipment, mix behavior, compaction, and/or strength characteristics. The test strip shall be constructed at a location chosen by the contractor at least 30 days before the start of paving operations. The contractor shall cooperate fully with the Engineer during construction and testing of the test strip. During construction of the test section, the Contractor will establish an optimum rolling pattern and procedure for obtaining a density of not less than 98% of the maximum wet density in accordance with ASTM D 1557. In addition, the Contractor must also demonstrate the ability to achieve a smooth, hard, uniform surface free of excessive tears, ridges, spalls and loose material. After completion of the test section, beams and cores will be extracted to verify mix compliance. This will be performed by the Independent Testing Laboratory, at the expense of the Contractor. During the trial placement, the City’s Testing Personnel shall calibrate their nuclear density gauges in accordance with ASTM C 1040, with a sample of the test section

mix. Moisture readings of the gauge shall be calibrated using oven dry samples of the plant-mixed R.C.C. If all aspects of the test strip have been previously satisfied, the engineer may waive this requirement on a project-by- project basis.

Pre-placement: The Contractor shall ensure quality control at the plant, by controlling materials, obtaining test samples and ensuring segregation is not occurring while loading haul trucks.

The private Testing Laboratory will develop a moisture/density relationship of the actual job materials in accordance with ASTM D 1557. Optimum moisture content, maximum dry and wet densities will be established.

Compressive Strength Testing: During the mix design development, the Independent Testing Laboratory shall produce six (6" x 12") diameter cylinders, in accordance with ASTM C 1435, to perform a 28 day compressive strength test of the material to verify mix conformance. Handling and curing shall be in accordance with ASTM C 31. The Engineer may require additional tests at different ages. Compressive strength testing shall be in accordance with ASTM C 39.

During Placement: The Contractor, in cooperation with the Independent Testing Laboratory, shall ensure that compaction and grade specifications are met and time limits are adhered to.

Field Density: The City's Testing Laboratory shall perform density testing of the R.C.C. in accordance with ASTM C 1040, direct transmission mode, as soon as possible, but no more than 30 minutes, after completion of rolling. Only wet density shall be used for evaluation. The required density shall be a minimum of 98% of the maximum wet density. At least 5 tests shall be performed for each 250 cubic yards placed. The Contractor shall be responsible for verifying required densities are achieved by the paver.

If density tests indicate that the material does not meet the required density, the Engineer, in collaboration with the Contractor and the City's Testing Laboratory, shall determine the source of the problem, whether mix properties, segregation, or gauge calibration. If mix properties have changed, or the concerns cannot be resolved, placement shall be suspended until the problem is corrected.

After Placement: The City's Testing Laboratory shall core at least nine (9) 3 1/2 inch diameter cylindrical specimens from the interior of the slab for compliance verification. Length measurements of the cores and compressive strength testing shall be in accordance with ASTM C 42. The actual number of cores will be determined as defined in section 451.16 of the CMSC. Testing will be conducted as follows:

Compressive Strength Testing: Three (3) of the cores obtained for thickness verification will be tested for compressive strength at 28 days.

Splitting Tensile Strength: Three (3) of the cores obtained for thickness verification will be tested for splitting tensile strength at 14 days.

Density Test: The three (3) core samples obtained for splitting tensile strength will also be tested for density PCF.

The remaining three cores will be held for backup testing and/or further review as necessary.

Flexural Strength Testing: At the option of the project Engineer, the Contractor/Independent Testing Laboratory shall cut at least three (3) rectangular beams from the interior of the slab, in accordance with ASTM C 42, to perform a 14 day flexural strength test of the material. Additional tests at different ages may be required by the Engineer.

1523.12 Defective RCC

Repairs: All repairs are subject to the Engineers approval. Correct deficiencies while R.C.C. is still plastic; otherwise do repairs after seven (7) days. After seven (7) days, the R.C.C. shall be removed by saw cutting full depth before removal. Replace the R.C.C. utilizing a Cast-in-Place concrete meeting the requirements of section 499; Class B or E Concrete as directed by project Engineer. The new concrete shall be doweled into the existing R.C.C. utilizing epoxy coated reinforcing bars unless the RCC option is utilized.

Remove and replace R.C.C. if determined deficient in thickness by following the procedure set forth in section 451.16 of CMSC.

Any R.C.C. pavement found to be of unacceptable thickness, or deficient in any testing done according to 1523.11, may be subject to removal and replacement by the contractor, at no cost to the City, including removal and replacement of any intermediate and surface asphalt courses.

Grind off high surface variations to a finish acceptable to the Engineer.

Filling of low areas with fresh R.C.C. is not permitted.

If asphalt surfacing is specified, low areas shall be made up with additional surfacing material without extra payment.

1523.13 Asphalt Surfacing / Opening to Traffic

The R.C.C. pavement may be asphalt surfaced as specified on the plans once the requirements of Section 1523.06 have been met and all transverse contraction joints have been constructed.

If the R.C.C. pavement is not to be asphalt surfaced immediately, all traffic shall be restricted from using the R.C.C. until seven (7) days has elapsed or all strength requirements of Section 1523.03 have been met. At any time prior to the expiration of the above mentioned seven (7) day period, the R.C.C. may be asphalt surfaced as specified on the plans and then opened to traffic.

1523.14 Warranty

Pavement constructed according to this specification shall be guaranteed by the developer/owner for a period not less than two (2) years from date of acceptance of the street by the City Engineer.

1523.15 Basis of Payment

The accepted quantities of R.C.C. pavement will be paid for at the contract unit price per square yard *(square meter)*, which price and payment shall be full compensation for furnishing and placing all materials including reinforcing steel, dowels, and joint materials.

No additional payment over the unit contract bid price will be made for any pavement which has an average thickness in excess of that shown on the plans.

Payment for accepted quantities, complete in place, will be paid for at the contract price for item Supplemental Specification 1523.

Item	Unit	Description
1523	Square Yard	Roller Compacted Concrete

Bid Tab

Name of Project: **2015 STREET PROGRAM, ST-1029**

Contractor: _____

Address: _____

_____

Bid Opening: April 3, 2015

Phone Number: **( ) -**

Base Bid

Bid Item	Spec Item	Description	Unit	Qty	Labor	Material	Unit Price	Bid Price
1	254	1" to 3" Planing	SY	38,535			$ -	$ -
2	407	Tack Coat	GAL	3,632			$ -	$ -
3	423	Crack Seal	SY	83,000			$ -	$ -
4	448	1-1/2" Asphalt Concrete, Intermediate Course	CY	1,242			$ -	$ -
5	448	1-1/2" Asphalt Concrete, Surface Course	CY	156			$ -	$ -
6	448	1-1/2" Asphalt Concrete, Surface Course 70-22M	CY	1,452			$ -	$ -
7	608	PCC Concrete Walk	SF	300			$ -	$ -
8	608	Curb Ramp, Type C	EA	10			$ -	$ -
10	609	Curb Replacement	LF	283			$ -	$ -
11	644	Arrow On Pavement	EA	18			$ -	$ -
12	644	Edgeline	LF	19,825			$ -	$ -
13	644	Centerline, Solid Double Yellow/Solid_dash	LF	14,116			$ -	$ -
14	644	Crosswalk	LF	462			$ -	$ -
15	644	Stop Line	LF	78			$ -	$ -
16	644	School Symbol	EA	1			$ -	$ -
17	SPEC	Loop Detector	EA	1			$ -	$ -
18	SPEC	Storm Sewer Improvements	LS	1			$ -	$ -
19	SPEC	Mill Street Crosswalk Upgrades, Complete	LS	1			$ -	$ -
20	SPEC	Mill & Granville Street Crosswalk Repairs, Complete	LS	1			$ -	$ -
21	SPEC	Aggregate Berm	LF	17,562			$ -	$ -
22	SPEC	Full Depth Pavement Repair	SY	2,453			$ -	$ -

TOTAL (BASE BID): **$** -

Bid Tab

Name of Project: **2015 STREET PROGRAM, ST-1029**

Contractor: _____

Address: _____

_____

Bid Opening: April 3, 2015

Phone Number: **( ) -**

ALTERNATE BIDS

The pricing of the alternates is mandatory. The City may select the base bid only, or a combination of the base bid with the alternate bids to determine the lowest and best bidder.

ALTERNATE 1

Agler Road Resurfacing

Bid Item	Spec Item	Description	Unit	Qty	Labor	Material	Unit Price	Bid Price
23	254	1" to 3" Planing	SY	10,050			$ -	$ -
24	407	Tack Coat	GAL	101			$ -	$ -
25	448	1-1/2" Asphalt Concrete, Intermediate Course	CY	420			$ -	$ -
26	448	1-1/2" Asphalt Concrete, Surface Course 70-22M	CY	420			$ -	$ -
27	608	PCC Concrete Walk	SF	200			$ -	$ -
28	608	Curb Ramp, Type C	EA	2			$ -	$ -
29	609	Curb Replacement	LF	100			$ -	$ -
30	644	Arrow On Pavement	EA	18			$ -	$ -
31	644	Centerline, Solid Double Yellow/Solid_dash	LF	5,234			$ -	$ -
32	644	Crosswalk	LF	75			$ -	$ -
33	644	Stop Line	LF	17			$ -	$ -

TOTAL (Alternate 1): **$ -**

Bid Tab

Name of Project: **2015 STREET PROGRAM, ST-1029**

Contractor: _____

Address: _____

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Bid Opening: April 3, 2015

Phone Number: **( ) -**

ALTERNATE 2

Detroit Street Rebuilds

Bid Item	Spec Item	Description	Unit	Qty	Labor	Material	Unit Price	Bid Price
34	203	Embankment using Item 304 (12" + 2" Choker)*	CY	675			$ -	$ -
35	203	Excavation	LS	1			$ -	$ -
36	203	Excavation of Unsuitable Material	CY	675			$ -	$ -
37	204	Geotextile Fabric	SY	900			$ -	$ -
38	306	7" Concrete Base	SY	13,183			$ -	$ -
39	407	Tack Coat	GAL	1,319			$ -	$ -
40	410	Traffic Compacted Surface	CY	225			$ -	$ -
41	418	Sawing & Sealing Asphalt Concrete Pavement Joint	LS	1			$ -	$ -
42	448	1-1/2" Asphalt Concrete, Intermediate Course	CY	550			$ -	$ -
43	448	1-1/2" Asphalt Concrete, Surface Course	CY	550			$ -	$ -
44	608	PCC Concrete Walk	SF	14,875			$ -	$ -
45	608	Curb Ramp, Type C	EA	26			$ -	$ -
46	609	Combination Curb & Gutter Inc. 4" Underdrain	LF	8,300			$ -	$ -
47	614	Maintenance of Traffic	LS	1			$ -	$ -
48	623	Construction Layout Stakes	LS	1			$ -	$ -
49	644	Crosswalk	LF	566			$ -	$ -
50	644	Stop Line	LF	186			$ -	$ -
51	653 & 659	Topsoil, Seeding & Mulching	LS	1			$ -	$ -
52	SPEC	Asphalt Expansion Joints	EA	5			$ -	$ -
53	SPEC	Remove/Replace Base of Concrete Drives	SY	1,666			$ -	$ -
54	SPEC	Remove/Reset Curb Inlet Top Slab	EA	5			$ -	$ -

TOTAL (Alternate 2): **$ -**

Bid Tab

Name of Project: **2015 STREET PROGRAM, ST-1029**

Contractor: _____

Address: _____

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Bid Opening: April 3, 2015

Phone Number: **( ) -**

ALTERNATE 3

Replace Bid Item 38, Item 306 - 7" Concrete Base with Item SPEC - 7" Roller Compacted Concrete Base in accordance with City of Columbus Supplemental Specification 1523.

Ref	Item	Description	Unit	Qty	Labor	Material	Unit Price	Total
55	SPEC	7" Roller Compacted Concrete Base	SY	13,183			$ -	$ -

TOTAL (Alternate 3): **$ -**

ALTERNATE 4

Heil Drive Waterline Replacement

Bid Item	Spec Item	Description	Unit	Qty	Labor	Material	Unit Price	Bid Price
34		8" C-900 PVC Pipe with Item 911 Backfill	LF	1,510			$ -	$ -
35		8" Valve w/Box	EA	2			$ -	$ -
36		Fire Hydrant (Type A or B per COG)	EA	4			$ -	$ -
37		3/4" Water Service Taps, Transferred , As per Plan	EA	36			$ -	$ -
38		8"x6" Tapping Sleeve and Valve	EA	1			$ -	$ -

TOTAL (Alternate 4): **$ -**

ALTERNATE 5

Reclamite Ashphalt Rejuvenating Agent

Bid Item	Spec Item	Description	Unit	Qty	Labor	Material	Unit Price	Bid Price
39	SPEC	Reclamite Ashphalt Rejuvenating Agent	SY	38,535			$ -	$ -

TOTAL (Alternate 5): **$ -**